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To Professor Bennett
From the author

ON

EQUINE DISEASE,

AND

ITS VITAL CAUSES.

BY

WILLIAM HAYCOCK, M.R.C.V.S.

*An Essay delivered before the Liverpool Veterinary Medical
Association, August 11th, 1865.*

LONDON :

PRINTED BY J. E. ADLARD,

BARTHOLOMEW CLOSE.

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1865.

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IN 'Hooper's Medical Dictionary,' article "Disease," you will find the following division of this important subject—a division so simple and direct in its character that no apology is needed on my part for adopting it:

- "Diseases," says the writer, "may be—
- "*Local*, *i. e.* affecting some particular part.
 - "*Constitutional*.—Affecting the entire organism.
 - "*Specific*.—Marked by some disordered vital action, not common to disease in general, but peculiar to the individual disease.
 - "*Idiopathic*.—Primary, and not dependent on any other disease.
 - "*Symptomatic or Sympathetic*.—Dependent on and accompanying some other disease.
 - "*Periodical*.—Recurring at fixed periods.
 - "*Acute*.—Severe, and of short continuance.
 - "*Chronic*.—Of long continuance.
 - "*Sporadic*.—Arising from adventitious causes affecting the individual.
 - "*Epidemic*.—Prevailing generally, and arising either from contagion or some atmospheric cause, the influence of which is felt extensively.
 - "*Endemic*.—Peculiar to, or especially prevalent in, a certain district or region.
 - "*Contagious or Infectious*.—Communicable from one individual to another, by personal contact or by effluvia diffused through the air.
 - "*Congenital*.—Born with the individual.
 - "*Hereditary*.—Descending from the parents to offspring.

“*Acquired*.—Neither hereditary nor congenital, but dependent on some cause operating after birth.

“*Sthenic*.—Attended with strong activity of the life powers.

“*Asthenic*.—Attended with sinking of the life powers.

“In addition to the above, other distinctions of disease may be made of more limited application; thus, diseases are *febrile*, *i. e.* attended with fever; *exanthematous*, *i. e.* attended with eruption; *intermittent*, marked by a regular cessation and recurrence of symptoms; *remittent*, marked by a regular diminution and return of the symptoms.

“*Mild*, unaccompanied with any symptoms of a formidable nature.

“*Malignant*.—Severely depressing to the life powers or highly dangerous and intractable.

“*Puerperal*, *i. e.* incident to the puerperal period; and so forth.”

By this arrangement of the subject we obtain, comparatively speaking, a very complete picture of the various conditions, specialities, and associations, under which disease is presented to our notice.

The next question (and a most essential one it is) is this, *What is disease?* To answer it properly requires us in the first place to determine what life is, for the doctrine of disease is inseparably associated with the doctrine of life.

The healthy functions of the organism constitute the province of the physiologist; the structure of the organs performing the various functions belongs to the anatomist; and it is with the derangements of both functions and organs, so far as the lower animals alone are concerned, that constitutes the peculiar province of the veterinary surgeon. Hence in our province, as in that of the human surgeon, the inseparable relation of the doctrine of life to the doctrine of disease.

An intimate knowledge of healthy structure is vitally essential to an intimate knowledge of healthy function.

An intimate knowledge of healthy function is vitally essential to an intimate knowledge of disease; and all disease is either deranged vital force which terminates as such merely, or deranged vital force producing an alteration or derangement of structure.

Gentlemen, What is life? A question which the present state of our knowledge does not permit us to answer. Innumerable doctrines, both in ancient and modern times, have been put forth respecting the nature and origin of life, which have all this character in common—they are the highest expression, so to speak, of the predominating philosophies peculiar to the time of their appearance.

The tendency of physiologists of the present day is to regard the living principle as a mere combination, consisting of chemical and mechanical forces.

It is true the functions of mastication, insalivation, and deglutition, are simply mechanical actions; that digestion, respiration, the production of animal heat, and the waste of tissue, are all simple and, in themselves, chemical actions.

But allow me to ask, What is the nature of that central power which keeps this animal organization working, growing, digesting, assimilating, carbon burning, decaying, and renovating itself, year after year, in the manner we behold it?

What is this central power, I repeat, which presides over all, and regulates all, as a king presides upon his throne and regulates the most distant affairs of his kingdom?

Why, gentlemen, it is just the vital principle.

Bear in mind, then, this entity or principle I speak of is not a chemical or a mechanical power; nor yet galvanism nor electricity; nor, so far as we know, any modification of these forces; but it is an original power or principle which seizes upon the elements of the external world, and the forces which are bottled up, as it were, within them, and by its directing, controlling, and organizing power it builds up and vitalises the wondrous forms we behold in the animal and vegetable worlds.

The next step in our inquiry relates to health. *What is health?* To define this in a way to fully meet the requirements of the question is difficult. We can only properly define a thing by telling all about it.

The principal conditions of health in a horse are as follows:—The animal looks well, feeds well, rests well, and performs his apportioned labour with ease to himself and satisfaction to his owner.

Well, he may present all the above essentials, and yet be diseased in a way that is incurable.

An exposition of all the various functions of the body in their normal state is the physiology of health. An exposition of any or all of the various functions of the body abnormally performed is *the physiology of disease*.

The causes which produce health are resident within and without the body of the animal.

The causes which produce disease are in like manner resident within and without the body of the animal.

External agents, when brought under proper conditions in immediate contact with the organism, produce by their normal action a constant wasting and death of the nervous tissues, which is as speedily replaced by new material, out of which is formed new tissue.

The same agents, when brought under improper conditions in immediate contact with the same organism, may speedily produce by their abnormal action (unless prevented by competent skill) complete derangement and death of all the tissues. So that you perceive, gentlemen, the more closely we regard this matter the more closely we discover that disease is simply the natural forces of the organism deranged or perverted in their action.

From our present consideration of disease we naturally pass to a consideration of its causes.

The causes of disease have been variously named and arranged; they have been denominated *external* or extrinsic, *internal* or in-

trinsic, according as they operate upon the animal from *without* or *within*.

They have also been called *principal* and *accessory* or *concurrent*, disease proceeding chiefly from the former with the assistance of the latter. They have also been named *positive* and *negative*, from the manner in which they act upon the system.

The division, however, which has been generally adopted is into *remote* and *proximate* or immediate, according to their relation to the disease occasioned by them; the *remote* being the first in the chain of causation, the *proximate* or immediate those early changes which they effect in the system, and which constitute the first or primary condition of the disease.

The remote causes have been again divided into *predisposing* and *exciting* or *occasional* causes; the *predisposing* being those which influence the condition of the various functions, so as to favour the operation of those exciting causes whence disease more immediately springs.

The etiology now given is that usually adopted by the schools and by the generality of writers upon disease.

I beg to propose the following, not as being more true (for the arrangement given and the one I propose are convertible), but as more simple, and, perhaps, upon the whole, more comprehensive in its nature.

From every consideration which I have been enabled to bestow upon this question, it appears to me that all diseases may be classified under one of the three following orders, viz. *vital diseases*; secondly, *chemical diseases*; thirdly, *mechanical diseases*.

Regarding the matter in this light, the disease and the cause of the disease in numerous instances are not only to be viewed, but to be *treated* also, as inseparable. Or, again, we may say that all diseases originate from one of a threefold order of causes, viz. *vital*, *chemical*, and *mechanical*; or from two of these classes of causes acting in association. One, and perhaps the chief, difficulty in accepting this classification of disease is to know at all times where the vital forms terminate and the chemical begins, or where the chemical forms terminate and the vital begin; the two in all cases may be viewed as perfectly distinct in the mind, while in practice, in the majority of instances, we shall perhaps find them inseparable.

VITAL CAUSES, ORGANIC CAUSES.—In our investigations into the causes of disease it is important that we consider the organization and the forms resident within the organization of the animal itself. The organism and vital endowments of the horse are equally the cause of disease, as are any or all of the innumerable external causes to which morbid action is usually attributed. Elements of the greatest necessity and natural good to the animal under the normal conditions of life may, if allowed under other circumstances, as when the horse is affected with severe exhaustion and debility, arising either from disease or excessive labour, be produc-

tive of serious disturbance or even death to the patient ; these states, however, could not be unless the *vital* condition of the animal was such as to permit them.

Organic causes of disease (and health as well) naturally present themselves under two conditions—first, to such as have reference to the various forms of systemic disease ; the second, to such as have reference to local diseases.

The first comprises the heart and the lungs ; the second, defective formation of the limbs, organs, and various parts of the frame. How far the second class of organic causes may be dependent upon the peculiar organic operation of the former, is a question worthy of the most earnest attention of the physiologist.

The living energy of the horse (taking a hasty view of the question) may be stated to depend upon the *size* and the *power* of the heart and the capacity of the lungs—the heart to propel the blood, the lungs to purify it.

I am perfectly aware of other important and, indeed, absolute conditions in the production and maintenance of the vital energy, such as the vital energy of the great nervous centres—the supply to the digestive organs, and afterwards *by* the digestive organs, of an abundance of blood-forming materials—the supply of oxygen to the lungs, and so forth ; but an inquiry into these conditions I set aside upon the present occasion, not as foreign to our purpose, but as not immediately necessary to it.

The size and power of the heart of the horse, as a cause of health or of disease to the animal, are questions which have not received that attention from veterinary surgeons which they merit. I am not aware, indeed, that any of our various writers have referred even to the subject.

The facts which I shall present I think you will find conclusive.

TABLE

No.	Sex.	Colour.	Breed.	Height.	History of the animal.
1	Horse	Dark bay	Cob	hnds. in. 14 0	Was in the possession of his last owner for three years; never was ill during that period, save from a slight attack of epidemic; never known to be affected with disease prior to coming into possession of the last owner. (See <i>Veterinarian</i> , 1848, p. 18)*
2	Horse	Brown, black legs	Light draught-breed	15 2	Was purchased by owner when four years old; was in the family thirty years; was ill once with subacute pneumonia; subsequently suffered from megrims and lymphatitis. His labour up to his twenty-seventh year was always severe, since then he has been more favoured. (See Contribution 1)
3	Mare	Dark brown, black legs	Well-bred	12 0	Was in the possession of last owner eleven years; was always remarkably well, and could endure very great fatigue; never known to be ill. (See Contribution 2, Case 2)
4	Horse	Brown, black legs	Cob	14 2	Belonged to last owner for three years; never ill during that period; never known to be ill previously. (See Contribution 2, Case 4)
5	Mare	Bay, black legs	More than one-half-bred	15 0	Last owner had her thirteen years, during which period she was always healthy; never known to be affected with disease. (See Contribution 5, Case 1)
6	Mare	Bright bay, black legs	Nearly thorough-bred	13 3	Was in possession of last owner for three years and five months; not affected with disease during that period; previous history cannot be learnt; well known for her great speed and endurance of fatigue. (See Contribution 5, Case 3)
7	Horse	Dark brown, black legs	Cob	14 2	Was in possession of last owner for ten years; never suffered from disease during that period; was noted for his great speed as a trotter, and as possessing extraordinary powers of endurance; became affected with a cough twelve months before death, cause not known. (See Contribution 8, Case 2)

* The facts here stated are principally collated from a series of papers contributed not referenced are from

No. I.

Age at death, at least—	Kind of labour, and duration of ditto.	Cause of death	Weight of heart.	Additional observations.
Yrs. 18	Saddle and harness; his labour during the last three years regular and not severe	Accidental; collision with a truck in the street	lb. oz. 7 0	The height of every horse is given exclusive of the shoes, except <i>Eclipse</i> , and whether the shoes are included in his height or not I cannot tell, nor do I possess any means of ascertaining.
34	Principally for draught; when young was driven a good deal in harness	Destroyed on account of old age	9 11	The weight of every heart given is that of the organ carefully freed from fat.
14	Principally for harness; sometimes severe, being driven long distances	Congestion of the lungs, from being over-fed and afterwards severely driven	6 9	Average weight of all the hearts in this table, including the heart of <i>Eclipse</i> , 9 lb. 5 oz.
9	Saddle and harness; at times long severe journeys	Congestion of the lungs, in consequence of being over-ridden and then exposed to cold and wet	7 11	
16	General purposes; saddle or harness; regular, and never severe	Inflammation of the bowels, cause not known	8 6½	
8	Saddle and harness, and sometimes hunted; not regularly very severe	Concussion of the brain, causing coma and death	7 5	
17	Draught, on a farm; saddle and harness; occasionally very severely worked	Asphyxia, from the formation of an abscess in trachea	8 8	

by the author to the *Veterinarian* during the years 1848, 1849, and 1850. 11 50
the author's Case Book.

No.	Sex.	Colour.	Breed	Height.	History of the animal.
8	Horse	Dark brown	Light draught-breed	hnds. in. 15 2	Was in possession of last owner for, seven years, during which period was always healthy, and could endure any amount of fatigue; never known to have a cough. (See Contribution 8, Case 4)
9	Mare	Light bay, black legs	Light draught-breed	15 3	In possession of last owner three years prior to death; was never affected with disease from being a foal till within six months of her death, when she had an attack of epidemic catarrh, which left a cough. (See Contribution 3, Case 2)
10	Mare	Gray	Light draught-breed	15 3	In possession of last owner for six months prior to death; up to this period she had been remarkably healthy. (See <i>Veterinarian</i> , 1850, page 252)
11	Mare	Dark bay, black legs	Cob	15 0	In possession of last owner for six years; never known to have an hour's sickness in her life; was noted for her trotting powers and great endurance of fatigue
12	Mare	Dark brown	Cob	14 3	Bred by owner; never affected with disease of any kind, save strangles at two years of age; was noted for her great speed and endurance of fatigue; to use the language of the owner, " <i>she was never done.</i> " The day before her death she trotted two miles in a trifle under seven minutes
13	Mare	Dark bay	More than three-parts-bred	15 1	In possession of last owners for five years; had never suffered from disease to their knowledge; previous history uncertain; was of very wiry formation; well known by many to be a fast mare, and one that could bear almost any amount of fatigue
14	Mare	Light bay, black legs	Nearly thorough-bred	13 3½	Bought by last owner at two years old; in his possession five years; had strangles at three years of age, and on another occasion was affected by cough, neither affections requiring professional assistance; was noted for being a fast goer in harness; could gallop and leap well, and, to use a common phrase, "was as tough as pin-wire"

Age at death, at least—	Kind of labour, and duration of ditto.	Cause of death.	Weight of heart.	Additional observations.
Yrs.			lb. oz.	
15	Draught; last seven years heavy and laborious	Rupture of the stomach	9 8	The height of every horse is given exclusive of the shoes, except <i>Eclipse</i> , and whether the shoes are included in his height or not I cannot tell, nor do I possess any means of ascertaining.
9	Carting; regular and sometimes very severe	Typhoid pneumonia	8 8	The weight of every heart given is that of the organ carefully freed from fat.
7	General purposes	Rabies, from bite of a rabid dog	9 8	Average weight of all the hearts in this table, including the heart of <i>Eclipse</i> , 9 lb. 5 oz.
10	Saddle and harness; work sometimes very severe, and always irregular	Accident; ran away in harness, and was so injured as to render it necessary to destroy her	9 5	
16	Saddle and harness; sometimes carted; frequently trotted for wagers; labour sometimes very severe	Broken leg; fracture near the hock, from a kick; was destroyed	9 0	
10	Used entirely for harness; let out daily on hire, or used in a cab; labour very irregular, and always severe	Acute inflammation of the heart and acute congestion of the lungs, caused by being put in a cab and galloped for three miles at a very severe pace	8 10	
7	Used both for saddle and harness; sometimes very severe	Fracture of the left hind leg; was destroyed	7 12	

No.	Sex.	Colour.	Breed.	Height.	History of the animal.
15	Horse	Gray or white	Well-bred cob	hnds. in. 14 0	Was purchased by last owner at five years old, and in his possession nearly twenty years; was lame occasionally from corns in the fore feet; never was known to be ill; was never bled, nor had a ball given; was noted as a fast trotter, particularly in harness, and scores of times, was driven seventy miles a day (at least so said the owner); six months before death went blind of both eyes.
16	Horse	<i>Eclipse</i> , light chestnut or sorrel chestnut, the off hind leg white from the off shank to the foot	Thorough-bred	16 2	"The best horse that ever lived." History furnishes no parallel of such a horse; it is stated on good authority that his utmost speed was never known, as no horse could be found to call forth his extreme pace. "This famous horse was not only the best that ever this country saw as a racer, but he was no less so as a stallion, for his progeny, by their feats on the course in twenty-three years, won 344 races, producing to their owners the extraordinary sum of £158,000, various small sums and forfeits not included." His powers of endurance are so well known that it is useless to comment upon them.

TABLE

No.	Sex.	Colour.	Breed.	Height, exclusive of the shoes.	History of the animal.
1	Mare	Dark brown	Coach-horse-breed	hnds. in. 15 3½	In possession of last owner eight months; never throve well in his hands; was not hardy nor spirited; soon fatigued if worked a little severe. (See Contribution 3, Case 1)
2	Horse	Bay, and black legs	Light draught-breed	15 2	In possession of last owner eighteen months; was subject to severe attacks of colic; was of weak constitutional powers; if exerted beyond a moderate degree he failed in his appetite and required a day or two to recruit his energies. (See Contribution 2, Case 1)

Age at death, at least—	Kind of labour, and duration of ditto.	Cause of death.	Weight of heart.	Additional observations.
Yrs. 25	Saddle and harness; when younger was usually severe	Destroyed on account of old age	lb. oz. 8 8	The height of every horse is given exclusive of the shoes, except <i>Eclipse</i> , and whether the shoes are included in his height or not I cannot tell, nor do I possess any means of ascertaining.
26	A race-horse	Acute disease of the bowels	14 0	The weight of every heart given is that of the organ carefully freed from fat. Average weight of all the hearts in this table, including the heart of <i>Eclipse</i> , 9 lb. 5 oz.

No. II.

Age at death.	Kind of labour, and duration of ditto.	Cause of death.	Weight of heart.	Additional observations.
Yrs. Rising 6	Saddle and harness; seldom severe or long continued	Typhoid pneumonia	lb. oz. 7 4	Average weight of hearts in this table, 6 lb. 15½ oz.
6	Farm work, principally carting	Congestion of the lungs, cause not obvious	7 5	

No.	Sex	Colour.	Breed.	Height, exclusive of the shoes.	History of the animal.
3	Horse	Black	Light breed	hnds. in. 14 2	In possession of last owner two years; always very quiet; spiritless, and easily fatigued. (See Contribution 4)
4	Mare	Bright bay	Three-parts-bred	16 1	In possession of last owner three years; was never of strong constitution; three years before had a severe attack of pneumonia, the cause of which was not obvious; was also subject to attacks of specific ophthalmia and to grease, also to colic; had also chronic cough; could not endure fatigue or hard labour. (See Contribution 5, Case 2)
5	Horse	Gray	Three-parts-bred	15 3	In possession of last owner about a year; was a bad feeder and a bad thriver; suffered frequently from colic, also from cough; could not endure severe labour or fatigue; was what is denominated a "wasting" horse. (See Contribution 6, Case 1)
6	Mare	Dark bay	Half-bred	15 3	In possession of last owner two years, during which period she suffered several times from colic, catarrh, loss of appetite, and also chronic cough; was of very tender constitution; could not endure fatigue, and if allowed to stand a few hours in the stable the legs commenced swelling. (See Contribution 9, Case 2)
7	Horse	Black	Heavy draught-breed	16 0	In possession of last owner for two years; was of tender constitution; work, even of a moderate kind, would sometimes take away his appetite; once or twice he suffered from colic, and frequently from catarrh; at the time he was purchased by last owner he was affected with chronic cough of a very severe nature, which cough continued till death. (See Contribution 9, Case 4)
8	Mare	Dark bay or brown	Half-bred	16 0	Was in possession of the firm for two years previous to death; had six attacks of colic in the above period, a short time before death had pleuritis, and in addition was affected with chronic cough; was also a voracious feeder and a bad thriver; an extra amount of labour produced colic, and afterwards general debility. (See Contribution 9, Case 5)

Age at death.	Kind of labour, and duration of ditto.	Cause of death	Weight of heart	Additional observations.
Yrs. 5, within a month or two	Saddle; never worked hard; only carrying a person a few miles about home	Idiopathic phlebitis	lb. oz. 5 4	Average weight of hearts in this table, 6 lb. 15½ oz.
6	Saddle and harness; seldom put to any severe labour	Inflammation of the bowels	7 3	
6	Leader in a stage-coach; had to run 6½ miles out and the same distance back five days a week	Acute rheumatism	6 12	
6	Saddle and harness, and was occasionally worked in chains	Purpura hæmorrhagica	7 4	
8	Draught purposes entirely; work regular	Purpura hæmorrhagica	7 12	
6	Saddle and harness; occasionally draught purposes; labour seldom severe, generally regular	Purpura hæmorrhagica	7 0	

From the facts adduced you will perceive the peculiar views which I desire to establish.

I could have brought forward more facts of a precisely similar nature, but I deem these sufficient for the present. The conclusions with regard to this branch of causation which I desire to establish may be stated as follows :

The large and powerful heart causes health, vigour, and power of endurance to the horse.

The small and feeble heart is a most important predisposing cause of disease of a systemic character to the horse.

A powerful heart may be associated with powerful organs locally, in which case we may expect an example of the highest possible kind of health, vigour, and power of endurance, both systemically and locally. (*Eclipse* and others as example.)

A feeble heart may be associated with a powerful organ locally, in which case we may naturally expect a feeble system, and possibly good local health to such local organs as are strong.

A feeble vital endowment of any particular organ will be a cause of disease to such organ.

Lastly, a feeble heart and a feeble organ locally may exist in association, in which case we shall have, in every sense of the word, what is commonly called a weed.

ORGANIC CAUSES OF DISEASE, Class 2.—The second class of organic causes relate more especially to the general conformation of the animal; also sex, age, size, and colour. They are a class of causes generally known and pretty well understood, so that my remarks respecting them will be brief.

It is well known, as a rule, that very large-sized horses neither endure fatigue, nor are they so free from disease as smaller-sized horses and horses of more compact build.

Round-boned, gummy-limbed horses are more subject to grease, canker, itchiness of the skin and extremities, swelling of the legs, and various other diseases, than are flat-boned, clean-limbed horses.

Mares are more prone to diseases of a nervous and spasmodic character than geldings, and geldings are more prone than mares to diseases of the larynx, to paralysis of the laryngeal nerves, and to roaring; while, as a balance, as it were, to this, mares are more prone to broken wind and to chronic cough.

White hoofs are more brittle and more liable to sandcrack than hoofs of a dark colour. Light chestnut horses are seldom so vigorous and stolid as bays, browns, and blacks; while gray horses are subject at least to one peculiar disease, which horses of another colour appear exempt from, viz. melanosis. It is important also that the colour of a horse should be clear and definite. A clear bay, or brown, gray, chestnut, or black. Horses of a mixed or indefinite colour are frequently bad in temper and soft in constitution; such as a dirty muddy colour, as though bay and brown were mixed together, as a dirty bay or a dirty brown.

"There are some maladies," says Mr. Dun, "in which it is comparatively easy to trace the connection between conformation and

disease. Thus, bone spavins are most usually seen where there is a disproportion in the size of the limb above and below the hock; curbs where the os calcis is small and the hock straight; strains of the tendons of the fore legs where the limb is round and the tendon and ligaments confined at the knee; and navicular disease where the chest is narrow and the toes turned out. Amongst horses so formed, these diseases are more than usually common."

In remarking upon local peculiarities of conformation as causes of disease, I may also name certain peculiarities in connection with the entire organism; a horse, for example, having a flat form of body, with a wide space between the last rib and the hip, with a body somewhat pendulous, and with length of limb disproportionate to the other parts of the frame—such a horse is sometimes a voracious feeder, and at other times a poor one; also of great laxity of organism, and far more liable to disease of all kinds, especially to acute and chronic maladies of the digestive viscera, than horses which are differently formed.

CHEMICAL CAUSES, giving rise to chemical forms of disease.—Of this I may say we have numerous examples. *Scarlatina* I regard as a chemical disease. A subtle poison, of a kind not always known, invades the body, poisons the blood, and produces a direct disturbance upon the vital endowment of the system.

A second example is the production and formation of the material forming a calculus within the kidneys and the bladder.

A third example is hoven in cattle, the effects of which are pretty well understood by the generality of stock-owners.

A fourth example is glanders. I also suspect that numerous forms of epizootic diseases are purely chemical in their causation and origin, and that the most speedy and effectual way of restoring animals so affected to health will ultimately prove to be by the use of chemical means and chemical agents.

MECHANICAL CAUSES OF DISEASE.—Mechanical causes of disease may be either of a *direct* or *indirect* nature in the production of disease. A nail driven into the sensitive tissues of the foot, the consequences of which are well understood, is an example of a *direct* nature; while, on the other hand, disturbance within the organism of a vital or chemical nature may give rise to mechanical causes, which in turn may produce another series of vital disturbances of a nature entirely different from the first. A horse, for example, may be affected with colic, from which he might easily recover but for a simple and, perhaps, unexpected accident. The pain may be so severe as to cause the patient to plunge about, and, in so doing, the bowels, the stomach, or the diaphragm, may be ruptured, and thus place the animal in a moment beyond every hope of recovery. Instances of this kind are familiar to all. I merely give them to show the singular course of things—the inseparable relation which exists between healthy and diseased action; between health-producing and health-destroying influences, and more especially the way in which disease under peculiar circumstances becomes the further cause of disease.

From the above considerations respecting the causation of disease, we pass to other matters of a different character, but still closely related to the foregoing, amongst which we may especially consider—

1. Sympathy.
2. The periodicity of disease.
3. Association of diseases.
4. Second attacks of diseases of the same character.
5. Diagnosis of disease.

And, lastly, the principles to be pursued in the treatment of disease.

SYMPATHY.—The sympathy manifested by the organism of the horse in disease is a subject of the highest interest to the veterinary surgeon, and yet our numerous writers upon equine maladies have scarcely noticed it. To study it properly, with a view to exhaust the subject, would be to add a new chapter to comparative physiology. Every disease we have to treat presents to our notice illustrations of its influence. I cannot do more upon the present occasion than merely allude to a few of the more obvious facts in relation to it.

The moment that disease of an acute nature becomes established within the organism, either systemically or locally, we behold phenomena in association with it, which accompany the state of the patient, as one friend, so to speak, accompanies another.

The sympathetic symptoms of every disease constitute the majority of the symptoms present. They are NOT the disease, and yet they are inseparable from the disease.

You can no more have a case of pleuritis without alternate heats and chills of the system, without disturbance of the pulse, disturbance of the respiration, anxiety of the countenance, and that mute but suffering appeal of the eye which our patient turns towards us, no more, gentlemen, than you can have a living horse without head and limbs. Everything that pathognomically belongs to pleuritis is strictly limited to a few inches of space within the chest; the rest is entirely due to that mysterious agency—*Sympathy*.

The heart holds a similar relation to the living system that the hands of a clock hold to the works within; the former *indicates* the state of the living organs related to it; the latter, the state of the dead mechanical ones. "Nature," says Lord Bacon, "has a meaning in everything she does." Gentlemen, in few of her domains will the ardent veterinary student discover more deep and significant truths than in those he will derive by studying the laws of sympathy.

THE PERIODICITY OF PATHOLOGICAL PHENOMENA.—Morbid phenomena are manifested periodically. The pains of colic appear and subside periodically. The excited pulse attendant upon fever is increased towards evening, and subsides towards morning, so long as the disease continues. These and other states of a similar character, easy to particularise, are strictly in accordance with the phenomena manifested by the organism when in health.

The horse eats and drinks periodically, works and rests periodically, both in his system and in the various organs which compose his system.

Towards morning his heart rises in the number and force of its beats, and as evening approaches the same organ diminishes both in the force and in the number of its beats. Everything throughout the vast domain of nature is the same. The Nile overflows periodically. The tides ebb and flow periodically. The motions of the heart and the living forces resident within the organism of the horse, are linked by mysterious laws to the tides of the sea, to the revolutions of the stars, and to the powers of the universe.

THE ASSOCIATION OF DISEASES.—It is a matter of common occurrence to behold two or more diseases in association, such as grease with disease of the digestive organs, old inveterate skin disease with stomach disease, disease of the stomach with laminitis, ringworm in association with an inveterate cough and with gastric disease, inveterate forms of grease with lymphatitis, strangles with pneumonia, pneumonia with pleuritis, and a number of other affections with which veterinary surgeons of experience are all familiar; still, in all such associations the tissues affected appear to possess relations and sympathies of one common type and to be governed by laws of one common nature. We never behold such diseases in association as laminitis and scarlatina, laminitis and tetanus, tetanus and scarlatina, or acute inflammation of the lungs and laminitis, or acute inflammation of lungs and acute inflammation of the bowels. These latter forms of disease appear incompatible; why they are never seen in association it is impossible, in the present state of our knowledge, to explain.

SECOND ATTACKS OF DISEASE.—This is a question which is worthy of more attention than it appears to have received. Certain peculiar forms of disease are manifested by the same animal repeatedly. Colic is an example; while other diseases, if they are ever manifested, appear to render the animal exempt from all attacks of a like nature.

Whoever heard of the same horse being affected a second time with tetanus, or a second time with scarlatina or purpura, or animals of the bovine class with a second attack of pleuro-pneumonia? Are these exemptions solely a matter of accident? or do they arise from a cause we do not suspect?

The question, gentlemen, is certainly worth your consideration.

DIAGNOSIS OF DISEASE.—The diagnosis of disease I consider to some extent a gift. By study and experience it ought to be attained by those who desire to do so; but numbers of practitioners seem incapable of grasping its difficulties. The true key to the art, or the means by which the gift may be perfected or the power acquired, is by the study of the phenomena of sympathy.

Three fourths of the symptoms attendant upon every acute disease consist of sympathetic symptoms; and by separating these from the symptoms *strictly essential* to the malady itself we grasp the particular fact without further trouble.

As a rule, perhaps, the greatest difficulties we have to contend against in diagnosis are with some of the numerous forms of lameness we are occasionally called upon to treat; but common-sense, aided by a few practical rules which seldom or never deceive those who understand them, will generally enable us to detect the nature and seat of the malady.

THE PRINCIPLES TO BE PURSUED IN THE TREATMENT OF DISEASE.
—We are brought at last to the consideration of the treatment of disease.

Gentlemen, the proper principles to pursue in the treatment of disease is a very wide and important subject. It is one I could say much upon, but it is impossible I can do justice to it upon the present occasion. I shall therefore close my present essay with as few remarks as possible.

1st. Health and disease are simply states of the organism convertible into each other.

2nd. The laws of disease cannot be understood except by first understanding the laws of health.

3rd. The causes of disease are as much to be sought within as without the organism.

All disease-curing agents are disease-producing agents; consequently, by understanding the special relation which these powers (the powers of disease-curing and disease-producing) bear to each other, we of necessity learn the true nature of the curative power of the agents we employ.

[*Reprinted from the 'Veterinarian,' September, 1865.*]

